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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/249,312	02/12/1999	DAVID DI HUO	2925-248P	9794

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EXAMINER
ORGAD, EDAN

ART UNIT	PAPER NUMBER
2684	10

DATE MAILED: 03/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/249,312

Applicant(s)

HUO ET AL.

Examiner

Edan Orgad

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 1999.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21-34 is/are allowed.
- 6) ☒ Claim(s) 1-4 and 8 is/are rejected.
- 7) ☒ Claim(s) 5-7 and 9-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) ✓
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) ✓ / ✓
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,8,9.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Schlekewey et al (US Patent # 6,181,276).

Regarding claim 1, Schlekewey teaches a method for adjusting antenna radiation for a wireless network or segment thereof, the method comprising the steps of: varying antenna radiation directions of a plurality of antennas throughout ranges of antenna radiation directions (figure 4a, beams 1-N); measuring signal parameters for the varied antenna radiation directions for a plurality of measurement locations determining a resultant antenna radiation direction within the ranges for each of the antennas in the wireless network or segment thereof based upon the measured signal parameters (column 10, line 28- column 11, line 13).

Regarding claim 4, Schlekewey teaches the measuring step comprises measuring signal strengths as the signal parameters at the measurement locations (column 9, lines 52-57).

Regarding claim 8, Schlekewey teaches a method for adjusting antenna radiation for a wireless network or segment thereof, the method comprising the steps of (see abstract) varying antenna radiation directions of a plurality of antennas throughout ranges of antenna radiation

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directions in accordance with a schedule (column 4, lines 50-66); measuring signal strengths for the varied antenna radiation directions for a plurality of measurement locations (column 9, lines 52-57); organizing the measured signal strengths into a location measurement data structure corresponding to each measurement location; determining resultant antenna radiation directions within the ranges for the antennas in the wireless network or segment thereof based upon data in the location measurement data structure to reduce or minimize radio frequency interference in the wireless network (column 9, lines 44-57 & column 10, line 56- column 11, line7).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schlekewey et al (US Patent # 6,181,276) in view of Feisullin et al (US Patent # 5,949,988).

Regarding claim 2, Schlekewey fails to specifically disclose the resultant antenna radiation direction is defined as a two dimensional vector representing angle of azimuth from a corresponding antenna and a down-tilt angle from the corresponding antenna. However, in the same field of endeavor, Feisullin teaches an RF power distribution where antenna radiation direction is defined as a two dimensional vector representing angle of azimuth from a corresponding antenna and a down-tilt angle from the corresponding antenna (column 14, line

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66- column 15, line 3). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Feisullin's antenna arrangement with Schlekewey's in order to provide optimum coverage.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schlekewey et al (US Patent # 6,181,276) in view of Jolma Petri (WO 96 37969).

Regarding claim 3, Schlekewey fails to specifically disclose determining a resultant antenna radiation direction but fails to specifically disclose the resultant antenna radiation direction, is defined as including a central vector representing a peak gain of a main lobe of radiation, a first limit vector representing a first limit of radiation direction states, and a second limit vector representing a second limit of radiation direction states. However, in the same field of endeavor, Jolma teaches including a central vector representing a peak gain of a main lobe of radiation, a first limit vector representing a first limit of radiation direction states, and a second limit vector representing a second limit of radiation direction states (pg. 31, lines 6-18 & pg. 32, lines 17-22). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include Jolma's central vector representing a peak gain of a main lobe of radiation, a first limit vector representing a first limit of radiation direction states, and a second limit vector representing a second limit of radiation direction states with Schlekewey's invention in order to increase the efficiency of the usage of the pilot signal.

Allowable Subject Matter

Claims 5-7 & 9-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 5, the prior art fails to specifically disclose the determining step comprises determining a system-wide minimal average of an interference signal strength over a group of the measurement locations and identifying a constellation of resultant antenna radiation directions associated with the system-wide minimal average for the group.

Regarding claim 6, the prior art of record fails to specifically disclose the determining step comprises determining a system-wide minimal average of an interference signal strength plus background noise over a group of the measurement locations and identifying a constellation of the resultant antenna radiation directions associated with the system-wide minimal average for the group.

Regarding claim 7, the prior art of record fails to specifically disclose the determining step comprises determining a system-wide maximum signal-to-noise ratio average over a group of the measurement locations and identifying a constellation of resultant antenna radiation directions associated with the system-wide maximum for the group.

Regarding claim 9, the prior art of record fails to specifically disclose deriving averages of interference from the measured signal strengths and associating each average of interference with candidates for the resultant antenna radiation directions.

Regarding claim 10, the prior art of record fails to specifically disclose the determining step further comprises comparing successive averages of interference measurements associated

with corresponding candidates for the resultant antenna radiation directions to identify the candidates associated with a lower of a presently determined average of interference measurements and a previously determined lowest average of interference measurement.

Regarding claim 11, the prior art of record fails to specifically disclose selecting the resultant antenna directions as candidates corresponding to the lower of the presently determined average of interference and the previously determined lowest average of the interference measurement.

Regarding claim 12, the prior art of record fails to specifically disclose deriving step further comprises *assigning each of the measurement locations a corresponding weight factor for calculating a weighted average to replace and supercede the average of interference, a total of the measurement locations having an aggregate weight factor approximately or exactly equal to one.*

Regarding claim 13, the prior art of record fails to specifically disclose the determining step further comprises the steps of: *generating a random number to choose candidates for the resultant radiation pattern directions associated with an average lowest system-wide interference over the measurement locations; evaluating a probability that the chosen candidates actually provides the average lowest system-wide interference; estimating the chosen candidates as the resultant radiation pattern directions providing the average lowest system wide interference if the evaluated probability meets a requisite confidence criteria.*

Regarding claims 14-18, the prior art of record fails to specifically disclose the relationship produced in claims 14-18 in conjunction with the additional elements associated

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with the claims, is a unique combination of subject matter that is either taught or suggested by the prior art.

Regarding claim 19, the prior art of record fails to specifically disclose the varying step changes the antenna radiation directions throughout the ranges of radiation states in a manner commensurate with a stationary or mobile duration of a test receiver being coincident with each of the measurement locations.

Regarding claim 20, the prior art of record fails to specifically disclose the varying step establishes the schedule as a first list for organizing the antennas within the wireless network into an antenna measuring order and a second list for organizing a radiation direction measuring order for each antenna.

Claims 21-34 are allowed.

Regarding claims 21 and 28, the prior art of record fails to specifically disclose a plurality of base stations associated with corresponding antenna systems; a plurality of local antenna controllers for controlling antenna radiation directions of the antenna systems such that the antenna radiation directions associated with each antenna system are cycled throughout a range of antenna radiation directions; a plurality of local schedulers for communicating with corresponding ones of the local antenna controllers, *the local scheduler coordinating the antenna radiation patterns of different ones of the antenna systems in a time-division multiplex manner such that only one antenna radiation pattern from one antenna system and its associated base station is generated at any time during a measurement procedure.*

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,57,4461 Balanced diversity.

US 6,405,043 Method to characterize the prospective or actual level of interference at a point, in a sector, and throughout a cellular system.

US 6,400,335 Dynamic load sharing system and method using a cylindrical antenna array.

US 6,397,067 Roadside transmitter.

US 6,330,458 Intelligent antenna sub-sector switching for time slotted systems.

US 6,311,075 Antenna and antenna operation method for a cellular radio communications system.

US 6,282,434 Uplink and downlink transmission quality improvement by differentiated base station antenna pattern downtilt.

US 6,144,652 TDM-based fixed wireless loop system.

US 6,070,090 Input specific independent sector mapping.

US 6,006,113 Radio signal scanning and targeting system for use in land mobile radio base sites.

US 5,949,988 Prediction system for RF power distribution.

US 5,485,631 Manifold antenna structure for reducing reuse factors.

US 4,224,622 Apparatus for eliminating amplitude modulation interference in conically scanning radars.

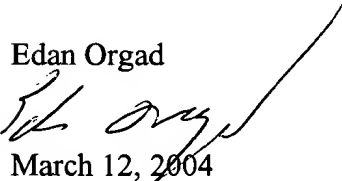
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edan Orgad whose telephone number is 703-305-4223. The examiner can normally be reached on 8:00AM to 5:30PM with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on 703-305-4223. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edan Orgad



March 12, 2004



NAY MAUNG

SUPERVISORY PATENT EXAMINER